

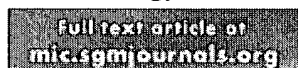


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☐ 1: Microbiology. 2002 May; 148(Pt 5): 1291-303.

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The ARO4 gene of *Candida albicans* encodes a tyrosine-sensitive DAHP synthase: evolution, functional conservation and phenoty of Aro3p-, Aro4p-deficient mutants.

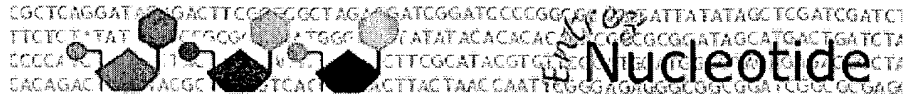
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Sousa S, McLaughlin MM, Pereira SA, VanHorn S, Knowlton R, Brown J, Nicholas RO, Livi GP.

Department of Comparative Genomics, Glaxo SmithKline, King of Prussia, PA 19406, USA.

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The enzyme 3-deoxy-D-arabinoheptulosonate-7-phosphate (DAHP) synthase catalyses the first step in aromatic amino acid biosynthesis in prokaryotes, plant and fungi. Cells of *Saccharomyces cerevisiae* contain two catalytically redundant DAHP synthases, encoded by the genes ARO3 and ARO4, whose activities are feedback-inhibited by phenylalanine and tyrosine, respectively. ARO3/4 gene transcription is controlled by GCN4. The authors previously cloned an ARO3 gene orthologue from *Candida albicans* and found that: (1) it can complement a *aro3 aro4* double mutation in *S. cerevisiae*, an effect inhibited by excess phenylalanine, and (2) a homozygous *aro3*-deletion mutant of *C. albicans* is phenotypically Aro(+), suggesting the existence of another isozyme(s). They do not report the identification and functional characterization of the *C. albicans* orthologue of *S. cerevisiae* Aro4p. The two Aro4p enzymes share 68% amino acid identity. Phylogenetic analysis places the fungal DAHP synthases in a cluster separate from prokaryotic orthologues and suggests that ARO3 and ARO4 arose from a single gene via a gene duplication event early in fungal evolution. *C. albicans* ARO4 mRNA is elevated upon amino acid starvation, consistent with the presence of three putative Gcn4p-responsive elements (GCREs) in the gene promoter sequence. *C. albicans* ARO4 complements an *aro3 aro4* double mutant in *S. cerevisiae*, an effect inhibited by excess tyrosine. The authors engineered $\Delta\text{aro3}/\Delta\text{aro3 } \Delta\text{aro4}/\text{MET3p}::\text{ARO4}$ cells of *C. albicans* (with one wild-type copy of ARO4 placed under control of the repressible MET3 promoter) and found that they fail to grow in the absence of aromatic amino acids when ARO4 expression is repressed, and that this growth defect can be partially rescued by aromatic amino acids and certain aromatic amino acid pathway intermediates. It is concluded that, like *S. cerevisiae*, *C. albicans* contains two DAHP synthases required for the first step in the aromatic amino acid biosynthetic pathway.



1: K01989. E.coli aroF gene ...[gi:145361]

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ORIGIN 26 bp upstream of RsaI site; about 56.7 min on K12 map.

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